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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,726	10/06/2003	David Haase	EMC-03-100CIP2	2876

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EXAMINER	
FARROKH, HASHEM	
ART UNIT	**PAPER NUMBER**
2187	

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/679,726	HAASE ET AL.	
	Examiner	Art Unit	
	Hashem Farrokh	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The instant application having application No. 10/679,726 has a total of 15 claims pending in the application; there are 3 independent claims and 12 dependent claims, all of which are ready for examination by the examiner.

INFORMATION CONCERNING CLAIMS:

CLAIM OBJECTION

1. Claims 9-14 are objected to because of the following informalities:

The dependent claims 9-14 recite: " the method of claim 8", but the independent claim 8 is a system claim. The dependent claim must be of the same type as the parent claim Appropriate correction is required.

CLAIM REJECTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double

patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2, 4, 6, 8-9, 11, 13 and 15 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 10-12, and 19-21 of copending Application No. 10/679,662 in view of U.S. Patent No. 6,898,681 B2 to Young.

This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

2. ***Claims 1, 8, and 15 of instant application (Application No. 10/673,726) are compared to claims1, 10 and 19 of copending application (Application No. 10/679,662) in the following table:***

Application No. 10/679,662	Application No. 10/679,726
Claim 1: 1. In a data storage environment having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data	**Claim 1:** 1. In a data storage environment having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data

content of the source being stored on the data storage system or on another data storage system, a method of managing data content during a restoration of the source, the method comprising the steps of:	content of the source being stored on the data storage system or on another data storage system, a method of managing data content during a restoration of the source, the method comprising the steps of:
restoring the source by copying data content from the clone to overwrite the data content of the source;	restoring the source by copying data content from the clone to overwrite the data content of the source,
receiving a host write request during the restoring step;	...allowing host read and writes to the source during the restore;
determining extents on the source that would be affected by the host write request if carried out; and	...determining extents on the source that would be affected by the host write request
if any extents affected are involved in the restoring step, then setting an indicator to indicate that the extents need to be re-copied.	if any extents affected by the host write request are involved in the restoring step, then setting an indicator to indicate that the extents need to be re-copied.

	If preserving the data content of clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step; and If preserving the data content of is not selected, then overwriting the data content of the clone during the restoration
Claim 10: A system for managing data content during restoration of data from a second volume of data to a first volume of data, the system comprising: a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the	**Claim 8:** A system for managing data content during restoration of data from a second volume of data to a first volume of data, the system comprising: a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the

source being stored on the data storage system or on another data storage system;	source being stored on the data storage system or on another data storage system;
computer-executable program logic configured for causing the following computer-executed steps to occur:	computer-executable program logic configured for causing the following computer-executed steps to occur:
restoring the source by copying data content from the clone to overwrite the data content of the source;	restoring the source by copying data content from the clone to overwrite the data content of the source,
receiving a host write request during the restoring step;	allowing host reads and writes to the source during the restore;
determining extents on the source that would be affected by the host write request if carried out; and	determining extents on the source that would be affected by the host write request;
if any extents affected are involved in the restoring step, then setting an indicator to indicate that the extents need to be re-copied.	if any extents affected by the host write request are involved in the restoring step, then setting an indicator to indicate that the extents need to be re-copied.

	If preserving the data content of clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step; and If preserving the data content of is not selected, then overwriting the data content of the clone during the restoration
Claim 19: A program product for use in a data storage environment and being for managing data content during restoration of data from a second volume of data to a first volume of data, wherein the data storage environment includes: a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated	**Claim 15:** A program product for use in a data storage environment and being for managing data content during restoration of data from a second volume of data to a first volume of data, wherein the data storage environment includes: a data storage system having a first volume of data denominated as the source being stored on a data storage system, and a second volume of data denominated

as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system;	as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system;
the program product includes computer-executable logic contained on a computer-readable medium and which is configured for causing the following computer executed steps to occur:	the program product includes computer-executable logic contained on a computer-readable medium and which is configured for causing the following computer executed steps to occur:
restoring the source by copying data content from the clone to overwrite the data content of the source;	restoring the source by copying data content from the clone to overwrite the data content of the source,
receiving a host write request during the restoring step;	allowing host read and to the source during the restore;
determining extents on the source that would be affected by the host write request if carried out; and	...determining extents on the source that would be affected by the host write request;

if any extents affected are involved in the restoring step, then setting an indicator to indicate that the extents need to be re-copied..	if any extents affected by the host write request are involved in the restoring step, then setting an indicator to indicate that the extents need to be re-copied If preserving the data content of clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step; and If preserving the data content of is not selected, then overwriting the data content of the clone during the restoration

The subject matter claimed in the instant application is fully disclosed in the referenced copending application in view of Young.

4. In regard to claim 1 the copending application (10/679,662) include all claim limitations shown in table above but does not includes: "If preserving the data content of clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step; and If preserving the data content of is not selected, then overwriting the data content of the clone during the restoration"

Young teaches: "If preserving the data content of clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step; and" **(e.g., see column 8, lines 22-40; column 11, lines 23-30; column 20, lines 4-7)** *for not allowing the overwrite of the point in time copy.*

"If preserving the data content of is not selected, then overwriting the data content of the clone during the restoration" **(e.g., see column 11, lines 8-22; column 20, lines 1-3)** *for not allowing the overwrite of the point in time copy.*

Disclosures by instant application and Young are analogous because both references teach methods of managing data backup and restoration.

At the time of invention it would have been obvious to a person of ordinary skill in art to modify the storage system taught by the Applicants to include the point in time copying method taught by Young.

The motivation for using the point in time copying method (as taught by column 11, lines 48-62 of young) would have been to enable a user to access various different point in time copies and also enables a user, if necessary or desired, to restore the data in the master store to the data stored at a particular point in time data.

Therefore, it would have been obvious to combine disclosures by Young and instant application to obtain the invention as specified in the claim.

Referring again to claim 1 (line 13), the Application (10/679,662) recites only "host write request" *while the Application (10/679,726) recites* "allowing host reads and write to the source". *Young teaches this limitation (e.g., see column 15, lines 28-29 and*

column 18, lines 62-65) where the controller allows reads and writes to the master store or the source.

5. Claims 8 and 15 are rejected based on the same rational shown in rejection of claim 1 above.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> *The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.*

Claims 4, 6, 11, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

*6. In regard to claims 4, 6, 11, and 13 the expression "...*extents of the clone that may be different from the clone and the source" *is unclear. The specification does not explain this limitation. In addition the expression "may be" is an indefinite term.*

A clarification/correction is required.

Claim Rejections - 35 USC § 102

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-21 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,898,681 B2 to Young.

7. In regard to claim 1, Young teaches:

"In a data storage environment having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system **(column 4, lines 11-15; element 8 in Fig. 1)**, a method of managing the data content during a restoration of the source," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).** *For example the master store or volume represents the first volume and shadow store or volume represents the clone volume recited in the claim. The shadow store contains the point in time copy of master data, which is used for controlling, or managing data during the restoration of the master or the source. When data is overwritten, a new point in time copy is created and the previous point time is protected (e.g., not overwritten).*

"the method comprising the steps of:"

"restoring the source by copying data content from the clone to overwrite the data content of the source;" **(e.g., see column 11, lines 55-62).**

"allowing host reads and writes to the source during the restore;" **(e.g., see column 7, lines 18-38; column 8, lines 56-61).**

"if preserving the data content of clone by not allowing it to be overwritten by host writes during the restoring step." **(e.g., see column 8, lines 22-40; column 11, lines 23-30; column 20, lines 4-7).** *For example a point in time copy of data to be overwritten is being saved in the shadow store. Therefore, a copy of data to be overwritten is preserved.*

"if preserving the data content is not selected, then overwriting the data content of the clone during the restoration and determining extents on the source affected by any host write request;" **(e.g., see column 11, lines 8-22; column 20, lines 1-3).** *For example if the user select not to preserve the previous point time copy, the user instruct the controller to overwrite the point time copy and update the bitmap to indicate the extents (e.g., blocks) affected.*

"if any extents affected by the host write request are involved in the restoration and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied." **(e.g., see column 11, lines 8-22; Fig. 10).** *For example if the user select not to preserve the earlier point time, the point in time copy is overwritten and the corresponding bit in the bit map is set.*

8. *In regard to claims 2 and 9 Young teaches:*

"wherein the source and the clone are each represented by respective first and second logical units." **(column 2, lines 35-40; column 4, lines 11-15).** *For example Young teaches that that a plurality of volumes are grouped together as a single logical device (e.g., source logical unit). The point in time copy of logical device is stored in shadow storage, which is in separate volumes, or logical device, which represents the clone logical unit recited in the claim.*

9. *In regard to claims 3, 5, 7, 10, 12, and 14 Young teaches:* "wherein a map denominated as a protected restore map is used to track extents of the source that are modified during the restoring and preserving steps." **(e.g., see column 8, lines 22-40;**

Fig. 6a). *For example when a block in the master store is overwritten (e.g., modified), a corresponding bit in the shadow bit map is set to logic 1.*

*10. In regard to claims 4, 6, 11 and 13 the Examiner was not able to understand what the Applicant means by the expression: "...*extents of the clone that may be different from the clone and the source". *The Examiner search the specification to find support for this limitation, but was unable to find explanation of this limitation. In the following rejection of these claims, the examiner assumes "...*extents of the clone that may be different between the clone and the source" *(emphasis added).*

Referring again to claims 4, 6, 11 and 13 Young teaches:

"wherein a map denominated as a clone delta map is used to track extents of the clone that may be different from the clone and the source." **(e.g., see column 8, lines 22-40; Fig. 6a).** *For example copy bit map which represent clone delta map recited in the claim is used to track the data blocks which are different between the master and shadow stores. A logic 1 in the copy bit map indicates that the corresponding data in the master store is different from the shadow store. When data copied from the master to the shadow store the corresponding bit in the copy bit map is being set to a logic 0 indicating that both master store and shadow store contain identical data*

11. In regard to claim 8, Young teaches:

A system **(column 22, lines 24-26)** for managing data content during restoration of data from a second volume of data to a first volume of data," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).**

"the system comprising:"

"a data storage system having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system;" **(e.g., see column 4, lines 11-15; element 8 in Fig. 1).**

"computer-executable program logic configured for causing the following computer-executed steps to occur;" **(e.g., see column 25, lines 1-31; column 27, lines 38-46).**

"restoring the source by copying data content from the clone to overwrite the data content of the source;" **(e.g., see column 11, lines 55-62).**

"allowing host reads and writes to the source during the restore;" **(e.g., see column 7, lines 18-38; column 8, lines 56-61).**

"if preserving the data content of clone by not allowing it to be overwritten by host writes during the restoring step." **(e.g., see column 8, lines 22-40; column 11, lines 23-30; column 20, lines 4-7).** *For example a point in time copy of data to be overwritten is being saved in the shadow store. Therefore, a copy of data to be overwritten is preserved.*

"if preserving the data content is not selected, then overwriting the data content of the clone during the restoration and determining extents on the source affected by any host write request;" **(e.g., see column 11, lines 8-22; column 20, lines 1-3).** *For example if the user select not to preserve the previous point time copy, the user instruct the controller to overwrite the point time copy and update the bitmap to indicate the extents (e.g., blocks) affected.*

"if any extents affected by the host write request are involved in the restoration and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied." **(e.g., see column 11, lines 8-22; Fig. 10).** *For example if the user select not to preserve the earlier point time, the point in time copy is overwritten and the corresponding bit in the bit map is set.*

12. In regard to claim 15, Young teaches:

A program product **(e.g., column 4, lines 17-19)** for use in a data storage environment and being for protecting data content during restoration of data from a second volume of data to a first volume of data," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).**

"wherein the data storage environment includes:"

"a data storage system having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system;" **(e.g., see column 4, lines 11-15; element 8 in Fig. 1).**

"the program product includes computer-executable logic contained on a computer-readable medium and which is configured for causing the following computer-executed steps to occur:" **(e.g., see column 25, lines 1-31; column 27, lines 38-46).**

"restoring the source by copying data content from the clone to overwrite the data content of the source;" **(e.g., see column 11, lines 55-62).**

"allowing host reads and writes to the source during the restore;" **(e.g., see column 7, lines 18-38; column 8, lines 56-61).**

"if preserving the data content of clone by not allowing it to be overwritten by host writes during the restoring step." **(e.g., see column 8, lines 22-40; column 11, lines 23-30; column 20, lines 4-7).** *For example a point in time copy of data to be overwritten is being saved in the shadow store. Therefore, a copy of data to be overwritten is preserved.*

"if preserving the data content is not selected, then overwriting the data content of the clone during the restoration and determining extents on the source affected by any host write request;" **(e.g., see column 11, lines 8-22; column 20, lines 1-3).** *For example if the user select not to preserve the previous point time copy, the user instruct the controller to overwrite the point time copy and update the bitmap to indicate the extents (e.g., blocks) affected.*

"if any extents affected by the host write request are involved in the restoration and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied." **(e.g., see column 11, lines 8-22; Fig. 10).** *For example if the user select not to preserve the earlier point time, the point in time copy is overwritten and the corresponding bit in the bit map is set.*

Conclusion

The prior art made of record and not relied upon are as follows:

1. U. S. Patent Publication No. 2004/0260873 *to Watanabe describes Method and apparatus for managing replication volumes.*

2. U. S. Patent Publication No. 2003/0177322 *to* Crockett *et al. describes Synchronization and resynchronization of loosely-coupled copy operations between a primary and a remote secondary DASD volume under concurrent updating.*

3. U. S. Patent Publication No. 2003/0115432A1 *to* Biessener *et al. describes Data backup and restoration using dynamic virtual storage.*

4. U. S. Patent No. 5,592,618 *to Micka et al. describes Remote copy secondary data copy validation-audit function.*

Any inquiry concerning this communication should be directed to Hashem Farrokh whose telephone number is (571) 272-4193. The examiner can normally be reached Monday-Friday from 8:00 AM to 5:00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A Sparks, can be reached on (571) 272-4201.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information

about PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBS) at 866-217-9197 (toll-free).

HP
HF

2005-10-07

DONALD SPARKS
SUPERVISORY PATENT EXAMINER